1,1-DICHLOROETHYLENE

Also known as: 1,1-Dichloroethene, 1,1-DCE, Vinylidene chloride
Chemical reference number (CAS): 75-35-4

WHAT IS 1,1-DICHLOROETHYLENE?

1,1-Dichloroethylene (1,1-DCE) is a man-made substance used to make fire retardant fibers and polyethylene food wraps. It is a clear, colorless, flammable liquid with a mild, sweet smell. Dichloroethylene evaporates quickly at room temperature and can pollute the air.

When 1,1-DCE gets into water or on soil it evaporates quickly. However, in groundwater or soil, it breaks down very slowly.

Most 1,1-DCE in the environment results from industrial use and improper disposal.

HOW ARE PEOPLE EXPOSED TO 1,1-DICHLOROETHYLENE?

Most people who are exposed to 1,1-DCE are exposed to it at work.

Breathing: Most exposures happen when people breathe 1,1-DCE vapors. Low level exposures can occur in the home when people use products that contain 1,1-DCE. If the home water supply is contaminated, people can inhale the chemical when they use water for cooking, laundering, or bathing.

Drinking/Eating: People may be exposed to 1,1-DCE when they drink contaminated water or when they eat food that was wrapped in polyethylene. People who work or play around contaminated soils may be exposed to 1,1-DCE if they touch their mouths or eat with dirty hands.

Touching: 1,1-DCE can also pass through the skin. If home water supplies are contaminated, people may absorb the chemical through their skin when bathing or washing dishes.

DO STANDARDS EXIST FOR REGULATING 1,1-DICHLOROETHYLENE?

Water: The state and federal drinking water standards for 1,1-DCE are both set at 7 parts per billion (ppb). We recommend that you stop drinking water that contains more than 7 ppb of 1,1-DCE. If levels of 1,1-DCE are very high in your water, you may also need to avoid washing, bathing, or using the water for other purposes. Contact your local public health agency for more information specific to your situation.

Air: No standards exist for the amount of 1,1-DCE allowed in the air of homes. We use a formula to convert workplace limits to home limits. Based on the formula, we recommend levels be no higher than 0.1 parts per million (ppm) of 1,1-DCE in air. Most people can't smell 1,1-DCE until levels reach 500 ppm. If you can smell 1,1-DCE, the level is too high to be safe.

The Wisconsin Department of Natural Resources regulates the amount of 1,1-DCE that can be released by industries.

WILL EXPOSURE TO 1,1-DICHLOROETHYLENE RESULT IN HARMFUL HEALTH EFFECTS?

There is very little human health information available on the effects of exposure to 1,1-DCE. The following information is based on animal studies:

Short term exposure to high levels of 1,1-DCE can result in:

- Irritation of the nose, throat and lungs;
- Burning of eyes and skin; and
- Damage to liver, kidneys, nervous system, and heart.

The following long-term effects were observed in animal studies:

Cancer: 1,1-DCE is considered to be a possible cancer-causing substance. Laboratory animals developed kidney and adrenal gland tumors following exposure to high doses of 1,1-DCE.

Reproductive and Development: Animal studies showed damage to the developing fetus when the mother also showed signs of illness from exposure.

Organ Systems: Lung, liver, and kidney damage can occur.

In general, chemicals affect the same organ systems in all people who are exposed. However, the seriousness of the effects may vary from person to person.

A person's reaction depends on several things, including individual health, heredity, previous exposure to chemicals including medicines, and personal habits such as smoking or drinking.

It is also important to consider the length of exposure to the chemical; the amount of chemical exposure; and whether the chemical was inhaled, touched, or eaten.

CAN A MEDICAL TEST DETERMINE EXPOSURE TO 1,1-DICHLOROETHYLENE?

1,1-DCE can be detected in the breath, urine, blood, and body tissues. Breath tests are now the most common way to tell whether a person has been recently exposed to 1,1-DCE. These tests require specialized equipment and are not available at all doctor's offices. Your physician can tell you where these tests can be done.

Tests of lung, liver, and kidney function are used to assess damage to these systems. However, they cannot pinpoint the cause of the damage.

Seek medical advice if you have any symptoms that you think may be related to chemical exposure.

This fact sheet summarizes information about this chemical and is not a complete listing of all possible effects. It does not refer to work exposure or emergency situations.

FOR MORE INFORMATION

- Poison Control Center, 800-222-1222
- Your local public health agency
- Division of Public Health, BEOH, 1 West Wilson Street, Rm. 150, Madison, WI 53701-2659, (608) 266-1120 or Internet: http://dhfs.wisconsin.gov/eh

Prepared by the
Wisconsin Department of Health and Family Services
Division of Public Health, with funds from the
Agency for Toxic Substances and Disease Registry,
Public Health Service,
U.S. Department of Health and Human Services.

Printed on recycled paper

(POH 4345 *Revised* 12/2000)